

Installation Guide

hp StorageWorks A6826A PCI-X Host Bus Adapter for Linux 64-bit Systems

Second Edition (November 2003)

Part Number: AA-RV12A-TE

This guide describes how to install, configure, and troubleshoot the HP StorageWorks A6826A PCI-X host bus adapter for Linux 64-bit Itanium operating systems.

For the latest version of these Release Notes and other host bus adapter documentation, access the HP storage website at <http://h18006.www1.hp.com/storage/saninfrastructure.html>.



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about this guide

This installation guide provides information to help you:

- Install the A6826A PCI-X to Fibre Channel Host Bus Adapter for Linux.
- Contact technical support for additional assistance.

About this Guide topics include:

- [Overview](#), page 8
- [Conventions](#), page 9

Overview

This section covers the following topics:

- [Intended Audience](#)
- [Related Documentation](#)

Intended Audience

This book is intended for use by system administrators who are experienced with the following:

- Linux operating system
- Host bus adapters

Related Documentation

In addition to this guide, HP provides *HP StorageWorks A6826A PCI-X Host Bus Adapter for Linux Release Notes*.

Conventions

Conventions consist of the following:

- [Document Conventions](#)
- [Text Symbols](#)
- [Equipment Symbols](#)

Document Conventions

The document conventions included in [Table 1](#) apply in most cases.

Table 1: Document Conventions

Element	Convention
Cross-reference links	Blue text: Figure 1
Key and field names, menu items, buttons, and dialog box titles	Bold
File names, application names, and text emphasis	<i>Italics</i>
User input, command and directory names, and system responses (output and messages)	Monospace font COMMAND NAMES are uppercase monospace font unless they are case sensitive
Variables	<monospace, italic font>
Website addresses	Blue, underlined sans serif font text: http://www.hp.com

Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings.



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.



Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment Symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings.



Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.



Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.



Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.



Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: <http://www.hp.com>.

HP Technical Support

In North America, call technical support at 1-800-652-6672, available 24 hours a day, 7 days a week.

Note: For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the HP website under support: <http://www.hp.com/country/us/eng/support.html>.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at:

<http://www.hp.com/country/us/eng/prodserv/storage.html>.

From this website, select the appropriate product or solution.

HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers:
<http://www.hp.com>.

Adapter Features



This chapter describes the features of the A6826A Fibre Channel Host Bus Adapters (HBAs) for Linux and includes:

- [Performance Specifications](#), page 14
- [Environmental Specifications](#), page 15
- [Physical Specifications](#), page 16

Performance Specifications

The A6826A HBA is a 2-Gb, high-performance Direct Memory Access (DMA) bus master host adapter designed for high-end systems. The performance is derived from the ISP2312 chips.

This HBA has the following features:

- Combines a powerful Reduced Instruction Set Computing (RISC) processor, a Fibre Channel protocol manager (FPM) with 2-Gb Fibre Channel transceivers, and a peripheral component interconnect (PCI) or peripheral component interconnect-extended (PCI-X) local bus interface in a single-chip solution.
- Supports Private Loop Direct Attach (PLDA) and Fabric Loop Attach (FLA) connections.
- Supports bus master DMA.
- Supports Fibre Channel protocol-SCSI (FCP-SCSI), IP, and Fibre Channel-Virtual Interface (FC-VI) protocols.
- Supports point-to-point fabric connection (F-PORT FABRIC LOGIN).
- Complies with:
 - PCI Local Bus Specification revision 2.2.
 - PCI-X Addendum (revision 1.0) to the PCI Local Bus Specification.
 - Third-generation Fibre Channel–Physical and Signaling Interface (FC-PH-3) standard.
 - Fibre Channel-Arbitrated Loop (FC-AL-2) standard.
 - U.S. and international safety and emissions standards.

Environmental Specifications

Table 2 lists the HBA environmental specifications.

Table 2: HBA Environmental Specifications

Environment	Minimum	Maximum
Operating temperature	0 °C/32 °F	55 °C/131 °F
Storage temperature	-20 °C/-4 °F	70 °C/158 °F
Relative humidity (non-condensing)	10%	90%
Storage humidity (non-condensing)	5%	95%

Physical Specifications

Table 3 lists the HBA specifications.

Table 3: HBA Specifications

Type	Specification
Host bus	Conforms to <i>PCI Local Bus Specification</i> , Revision 2.2
Fibre Channel specifications	Bus type: fiber optic media Bus transfer rate: 200 MBps maximum at half duplex 400 MBps maximum at full duplex Interface chip: ISP2312
Central processing unit (CPU)	Single-chip design that includes a RISC processor, Fibre Channel protocol manager, PCI-XDMA controller, integrated serializer/deserializer (SEREDES), and electrical transceivers that can auto-negotiate a data rate of 1 Gbps or 2 Gbps.
RAM	256 KB per Fiber Channel Controller; Scalable to 4 MB
NVRAM	256 KB, field programmable
Flash	128 KB of flash ROM in two 64 KB, software selectable banks, field programmable
Onboard DMA	Five-channel DMA controller: two data and one command, one auto-DMA request, and one auto-DMA response.
Frame Buffers	Integrated 10 KB frame buffer FIFOs (6 KB receive and 4KB transmit) for each data channel.
Connectors	LC-style connector that supports non-OFC, multimode fiber optic cabling using a small form factor optical transceiver module.
Form factor	17.78 cm x 10.67 cm (7.0 in x 4.2 in)
Power Consumption (66MHz PCI-X Optic)	
Single Channel	~4.75 Watts
Dual Channel	~10.5 Watts

Installing the Adapter

2

This chapter describes the procedure for installing the A6826A Host Bus Adapter (HBA). This chapter includes:

- [Installation Prerequisites](#), page 18
- [Installing the Adapter](#), page 22

Refer to your host documentation for installing the HBA.



WARNING: Disconnect the host from the power source before installing the HBA. To reduce the risk of personal injury from hot surfaces, allow the internal server or workstation components to cool before touching.



WARNING: Electrostatic discharge (ESD) can damage electronic components. Be sure you are properly grounded before beginning this procedure. Refer to [Appendix C](#) for related ESD information.

Installation Prerequisites

Before you begin, make sure you have the following:

- A screwdriver (Phillips #1).
- An optical multimode cable with an LC-style duplex connector.
- Each HBA has a unique serial number that is located on the bottom of the adapter. Check the HBA and record its serial number, in the unlikely event that the NVRAM is corrupted.

Adapter Components

Figure 1 shows the HBA components that are referenced throughout this chapter.

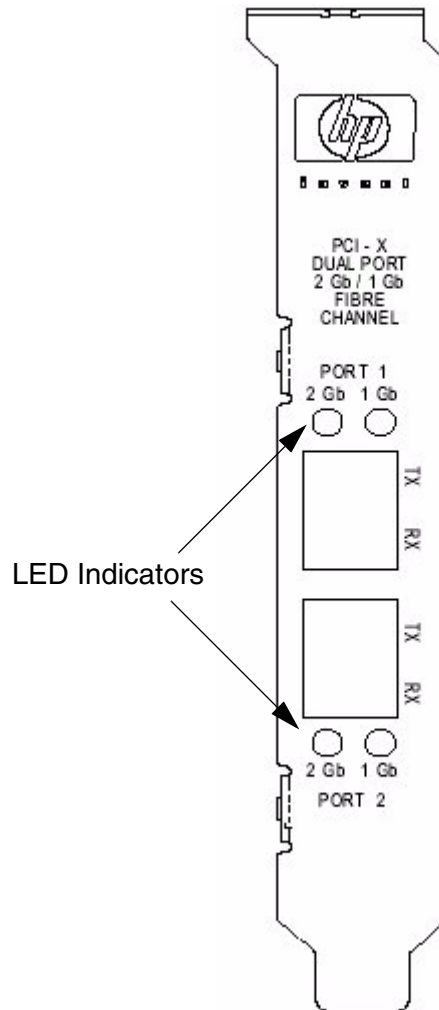


Figure 1: A6826A components

LED Indicators

Table 4 identifies and describes the activity of the LED indicators.

Table 4: LED Indicators Activity

Green LED (2Gb)	Amber LED (1Gb)	Comments	Activity
Off	Off		Power Off
On	On		Power On (before firmware initialization)
1 Flash/s	1 Flash/s	Both flashing at the same time like a heart beat.	Power ON (after firmware initialization)
2 Flash/s	2 Flash/s	Alternate flashing. This state changes to not-initialized state in 2-3s. Both LEDs are ON steadily.	Firmware Fault
OFF	ON		1G Link UP
ON	OFF		2G Link UP
OFF	5 Flash/s		Activity at 1G
5 Flash/s	OFF		Activity at 2G

Jumpers

The jumpers on the HBA are set to the default state of the laser and are set at the factory with a jumper plug on pins 1-2 of the J3 jumper and on pins 1-2 of the J4 jumper.



Caution: Changing the jumper settings can result in the HBA being inoperable.

Before You Begin Installation

The HBA is self-configuring. However, some motherboards require manual configuration. See the documentation supplied with your computer, or contact your computer dealer to determine if your motherboard requires configuration.

Some motherboards have two kinds of PCI bus slots: master and slave. The AB68A6A must be in a PCI bus master slot. (Some motherboards have PCI bus master slots that are shared with onboard devices. The AB68A6A does not work in shared slots.)

PCI connectors vary among system adapter manufacturers. The AB68A6A is a 64-bit PCI device that can function in a 32-bit PCI slot; the slot conforms to the PCI specification. The rear edge of the PCI slot is notched.



Caution: If you try to install the adapter in a PCI slot that does not conform to the PCI specification, you may damage the device.

PCI and PCI-X slots look the same. If the server contains both PCI and PCI-X slots, refer to the server manufacturer's instructions to determine the slot type.

The AB68A6A is designed and tested to operate at PCI bus speeds of up to 133 MHz.

Installing the Adapter

To install the HBA:

1. Check the motherboard and make any necessary configuration changes to accommodate the HBA.
2. Power down the peripherals, then turn off the computer.
3. Remove the computer cover and save the screws.
4. Choose any PCI bus slot that supports bus mastering.
5. Most motherboards automatically assign an IRQ level and interrupt line; if your motherboard does not, you must assign the IRQ level and use *interrupt line A* for this slot.
6. Remove the slot cover for the slot in which you will install the HBA.
7. Place the HBA in the slot. Carefully press the board into the slot until it seats firmly.
8. Secure the HBA to the chassis. Follow the server manufacturer's instructions.
9. Connect the appropriate cable from the devices to the corresponding LC-connector.
10. Carefully reinstall the computer cover. Insert and tighten the computer cover screws.
11. Power up all external FC devices, then power up the server and observe the monitor.

Installing the Linux Driver

3

This chapter provides instructions for installing the Linux driver for the A6826A HBA on an already installed Red Hat Enterprise Linux (Red Hat EL), kernel 2.4x or SUSE Linux Enterprise Server (SUSE SLES) for 64-bit Itanium system.

The software kit for this HBA can be obtained from the HP website:

<http://h18006.www1.hp.com/storage/saninfrastructure.html>.

This section provides instructions for installing the qla2300 driver into a Linux operating system.

To install the driver, you must be familiar with the operating system under which the HBA is to operate, and have access to standard system documentation.

To install the driver, you must perform the following:

- [Installing the Driver RPM](#), page 24
- [Building a Driver from the Sources](#), page 26
- [Installing the Driver on the Boot Drive](#), page 29
- [Loading the Driver](#), page 30
- [System Driver Parameter max_scsi_luns](#), page 33
- [Driver Command Line Parameters](#), page 34
- [Proc Filesystem Support](#), page 35

Installing the Driver RPM

The RPM Package Manager (RPM) is a package management system that lets you easily install Linux software. Using RPM, you can install software in prebuilt bundles called RPM packages. The driver RPM packages have prebuilt driver binaries, source code, and driver startup utilities. They are available for Red Hat ELAS and SUSE SLES.

To install a RPM, copy the RPM package file to your system and enter the following command:

```
# rpm -ivh <package_name>.rpm
```

Upgrading

To upgrade a RPM package, copy the RPM package file to your system and enter the following command(s):

- For Red Hat ELAS, enter:

```
# rpm -Uvh --nopostun --nopreun <package_name>.rpm
```

- For SUSE SLES:

```
# rpm -Uvh <package_name>.rpm
```

Uninstalling

To uninstall a RPM package, enter the following command:

```
# rpm -e qla2x00
```

Installing the fibreutils RPM

HP recommends installing the *fibreutils* RPM. It contains useful utilities, such as *hp_fccfg.sh*, for managing fibre-attached storage. To install this RPM, enter the following command:

```
# rpm -ivh fibreutils-<version>.rpm
```

For more information about fibreutils, refer to the file */opt/hp/hp_fibreutils/README*.

Changing Driver Parameters for HP StorageWorks XP Systems

If you are using the failover functionality built into the qla2x00 driver for HP XP storage arrays, you must change certain driver parameters. To do so, you can either run a script or manually make the changes.

Changing Parameters with a Script

1. Enter the following command:

```
# hp_fcconfig.sh
```
2. Choose **option 6**.
3. Enter **Y** when prompted if you want to enable failover functionality
4. Reboot or choose **option 5** to reload the driver.

Note: You may not be able to unload the qla2200 and/or qla2300 modules if there is a process or file system using a device that is attached to the A6826A adapter.

Changing Parameters Manually

1. Edit the `/etc/hp_qla2x00.conf` file using a text editor.
2. Change the **failover = 0** line to **failover = 1**.
3. Change the **port_down_retry_count = xx** line to **port_down_retry_count = 16**.
4. Change the **qdepth=xx** line to **qdepth=4**.
5. Reload the driver or reboot. To do so, enter the following commands to unload and reload the driver:

```
modprobe -r  
/etc/init.d/qla2300 start
```

Note: You may not be able to unload the qla2200 and/or qla2300 modules if there is a process or file system using a device that is attached to the A6826A adapter.

Building a Driver from the Sources

If your Linux kernel version does not match the prebuilt driver binaries, you need to build the driver in your configuration locally. To build a single-processor version of the qla2300 driver, see the section [Building a Uniprocessor Version of the Driver](#) on page 26. To build a symmetric multiprocessor (SMP) version of the qla2300 driver, see the section [Building a Multiprocessor Version of the Driver](#) on page 27.

Building a Uniprocessor Version of the Driver

Perform the following steps to build a uniprocessor version of the qla2300 driver:

1. If not already installed, extract the kernel-header and kernel-source RPM files from your Linux CD-ROM distribution. For example:

```
# cd /mnt/cdrom/RedHat/RPMS
# rpm -iv kernel-headers*.rpm
# rpm -iv kernel-source*.rpm
```

2. Locate the driver source files:

- If you have installed the driver RPM, the driver source files reside in `/opt/hp/storage_drivers/...`
- If you have copied your drivers from other media, copy the `qla2x00src-xx.xx.tgz` file to the `/home/qla2x00` directory. For example, if you have copied the driver source file on to a CD-ROM, enter:

```
# cd /home
# mkdir qla2x00
# cd /home/qla2x00
# cp /mnt/cdrom/qla* . (The period [.] at the end is required.)
# tar -xvzf qla*.tgz
```

3. Build the qla2300 driver from the sources:

- For RedHat, enter:

```
# make
```

- For SUSE, enter:

```
# make OSVER=linux
```

Building a Multiprocessor Version of the Driver

Perform the following steps to build an SMP version of the qla2300 driver:

1. If not already installed, extract the kernel-header and kernel-source RPM files from your Linux CD-ROM distribution. For example:

```
# cd /mnt/cdrom/RedHat/RPMS
# rpm -iv kernel-headers*.rpm
# rpm -iv kernel-source*.rpm
```

2. Change to the Linux source directory.

For Red Hat, enter:

```
# cd /usr/src/linux-2.4
```

For SUSE SLES, enter:

```
# cd /usr/src/linux
```

3. At the command prompt, enter the following:

```
# make menuconfig
```

- a. Choose **Processor type and features**, then press **Enter**. The **Processor Type and Features** menu displays.
- b. Choose **Symmetric Multiprocessor**, then press **Spacebar**.
- c. Click **Exit**. The system prompts:

```
Do you wish to save your new kernel configuration?
```

- d. Click **Yes**. The system saves a new config file in the current directory.

4. At the command prompt, enter the following:

```
# make dep
```

5. Locate the source files:

- If you have installed the driver RPM, the driver source files reside in `/opt/hp/storage_drivers/...`
- If you have copied your drivers from other media, copy the `qla2x00src-vx.xx.tgz` file to the `home/qla2x00` directory. For example, if you have copied the driver source file on to a CD-ROM, enter:

```
# cd /home
# mkdir qla2x00
# cd /home/qla2x00
# cp /mnt/cdrom/qla* . (The period [.] at the end is required.)
# tar -xvzf qla*.tgz
```

6. Build the qla2300 driver from the sources:

- For RedHat, enter:

```
# make SMP=1
```

- For SUSE SLES, enter:

```
# make SMP=1 OSVER=linux
```

Installing the Driver on the Boot Drive

Note: The following instructions for installing the driver and loading and unloading the driver are required only if the driver has been built from source. If the driver binary was installed from the RPM, the driver loads at boot time.

Before installing the driver, note the following:

- The A6826A HBA must be installed in the system *before* installing the qla2300 driver.
- The `<kernel_release_version>` is the Linux kernel release version of your system.
- In the following examples, the path to your driver may be:

`/lib/modules/<kernel_release_version>/kernel/drivers/addon/...`

Perform the following steps to install the qla2300 driver on the boot drive:

1. Build the driver binary file. To build a driver binary from source files, see the section [Building a Driver from the Sources](#) on page 26.
2. Copy the `qla2300.o` binary file to the following directory:
`/lib/modules/<kernel_release_version>/kernel/drivers/scsi`
3. At the command prompt, enter the following command to update the module dependency:

```
# depmod -a
```

The qla2300 driver is now installed on your boot drive. However, the driver must be loaded before the system can access the devices attached to the HBA.

Loading the Driver

The qla2300 driver must be loaded before the system can access the devices attached to the A6826A HBA. To build a ramdisk image to automatically load the qla2300 driver at boot time, see the section [Building a Ramdisk Image to Load the qla2300 Driver](#) on page 30. To load the qla2300 driver manually, see the section [Loading and Unloading the qla2300 Driver Manually](#) on page 31.

Building a Ramdisk Image to Load the qla2300 Driver

You can load the qla2300 driver at boot time using a ramdisk image as follows in this Red Hat example.

1. For Red Hat, add the following line to the file `/etc/modules.conf`:

```
alias scsi_hostadapter qla2300
```

Note: If there are other SCSI host adapter boards installed on your system and the `scsi_hostadapter` alias is used, define a different alias (for example, `scsi_hostadaptern`. *n* is a number in the range 1–9).

2. Build a new ramdisk image that contains the `qla2300.o` object file. The driver binary file `qla2300.o` must be copied to

```
/lib/modules/<kernel_release_version>/drivers/scsi.
```

Note: The `<kernel_release_version>` is the Linux kernel release version of your system.

3. Add the dependency for the qla2300 driver and build the ramdisk image:

You can either run `depmod -a` or make sure the following line is in the `/lib/modules/<kernel_release_version>/modules.dep` file:

```
/lib/modules/<kernel_release_version>/kernel/drivers/scsi/  
qla2300.o: /lib/modules/<kernel_release_version>/kernel/  
drivers/scsi/scsi_mod.o
```

4. Build the ramdisk image file:

For a single-processor system, enter the following commands, replacing `x.x.xx-x.x` with your Linux version number:

```
/sbin/mkinitrd /boot/newinitrd-image x.x.xx-x.x
```

For a multiprocessor system, enter the following commands, replacing *x.x.xx-x.x* with your Linux version number.

```
/sbin/mkinitrd /boot/newinitrd-image x.x.xx-x.x.smp
```

5. Configure the boot loader with the new ramdisk image:
 - a. Modify the *elilo.conf* file to load the new ramdisk image by changing the following line:


```
initrd=/boot/initrd_file_name
```

 For example:


```
initrd=/boot/newinitrd-image
```
 - b. Reboot the system. Select the kernel with the new ramdisk image.

Loading and Unloading the qla2300 Driver Manually

Before loading the driver manually, first build the driver from sources as described in the section [Building a Uniprocessor Version of the Driver](#) on page 26 or the section [Building a Multiprocessor Version of the Driver](#) on page 27.

After manually loading the qla2300 driver, you can access the devices and unload the driver manually without rebooting the system. The driver is also unloaded each time the system is rebooted.

To load the qla2300 driver:

1. Manually install the driver binary:
 - a. Copy `qla2300.o` to the following directory:


```
/lib/modules/<kernel_release_version>/kernel/drivers/scsi
```
 - b. Update the dependency file.

You can either run `depmod -a` or make sure that the following line is in the file

```
/lib/modules/<kernel_release_version>/modules.dep
```

```
/lib/modules/<kernel_release_version>/kernel/drivers/scsi/qla2300.o:/lib/modules/<kernel_release_version>/kernel/drivers/scsi/scsi_mod.o
```
 - c. Enter the following command to load the driver:


```
# modprobe qla2300
```
 - d. Under the directory that contains the *qla2300.o* file, you can also enter the following command:


```
# insmod qla2300.o
```

Note: HP recommends loading the driver using the `modprobe` command so that any driver parameter value specified in the `/etc/modules.conf` file takes effect.

- e. If your system has a previous version of the qla driver, rename the old binary included in the original distribution to ensure that it does not interfere with the updated version as follows:

```
# cd /lib/modules/<kernel_release_version>/kernel/  
drivers/addon/qla2300  
# mv qla2300.o qla2300_rh.o
```

After renaming the older driver version, load the new driver using `modprobe` after updating the dependency file.

2. To manually unload the qla2x00 driver, enter the following command at the command prompt:

```
# modprobe -r qla2300
```


System Driver Parameter `max_scsi_luns`

Support for multiple LUNs can be configured in one of three ways. Currently, the maximum number of LUNs that can be scanned for each device is 128.

Note: If you have multiple HBAs, set `max_scsi_luns` to the largest number of LUNs supported by any one of these HBAs.

- To configure multiple LUN support during boot time, enter the following command at the boot prompt:

```
boot: linux max_scsi_luns=128
```

- If the SCSI Mid-Layer is compiled as a module, add the following line to the `/etc/modules.conf` file to scan for multiple LUNs at each boot:

```
options scsi_mod max_scsi_luns=128
```

- If the SCSI Mid-Layer is not compiled as a module, the boot loader can be configured to scan for multiple LUNs each time the system boots.

To complete the configuration, perform the following steps:

1. Add the following line to each of the kernel images listed in the `elilo.conf` file:

```
append="max_scsi_luns=128"
```
2. Reboot the system.

Driver Command Line Parameters

The following command line options are available:

- **Verbose**—This option provides detailed debug information. For example:

```
# insmod qla2300.o options = verbose
Waiting for LIP to complete....
scsi%d: Topology - %s, Host Loop address 0x%x
scsi(%d): LIP occurred
scsi(%d): LIP reset occurred
```

- **Quiet**—This option keeps the driver from displaying. For example:

```
# insmod qla2300.o ql2xopts = quiet
```

Proc Filesystem Support

The */proc* file system for the QLA2300 driver can be found in the */proc/scsi/qla2300/* directory. This directory contains an entry for each SCSI HBA in the system. Each entry presents information about the adapter and transfer statistics for each discovered LUN.

Troubleshooting

4

Three basic types of installation problems can cause the A6826A HBA to function incorrectly. This chapter includes:

- [Hardware Problem Checklist](#), page 37
- [System Configuration Problems](#), page 38
- [Fibre Channel Problem Checklist](#), page 38

The following sections provides checklists to help you determine why the HBA is not functioning properly.

Hardware Problem Checklist

- Are all of the circuit cards installed securely in the system?
- Are all of the cables securely connected to the correct connectors? Be sure that the FC cables that attach from the HBA connectors to the device are connected correctly. For example, the optical transmit connector on the HBA must be connected to the optical receive connector on the device. Some connectors require a firm push to ensure proper seating. An easy way to check for correct seating is to switch the connectors on either the HBA or the device, then reboot the system.
- Is the HBA installed correctly in the PCI slot? Is it seated firmly in the slot?
- Check for interference due to nonstandard PCI connectors.
- Is the data rate setting correct? Refer to [Appendix B](#) for information about setting the data rate.
- Are all external peripherals properly powered up? Refer to [Appendix B](#) for information about displaying attached devices.

System Configuration Problems

If you have problems with the motherboard connection, the adapter may not function properly.

All PCI-compliant and PCI-X-compliant systems automatically detect 32-bit or 64-bit adapters and set the appropriate bus speed (for example, 33 MHz or 133 MHz). Check the motherboard for proper configuration.

See the documentation supplied with your computer, or contact your computer dealer to determine if your motherboard requires special configuration.

Fibre Channel Problem Checklist

- Were all of the FC devices powered up before you powered up the server?
- Check that all cables are properly connected.
- Have you configured the RAID controller using the utilities provided by the manufacturer?
- Some Fibre Channel switches support zoning. Make sure that the switch is configured correctly.

Configuring Adapters



This appendix describes how to configure the A6826A HBA.

The A6826A functions correctly on Linux Itanium systems using the factory default configuration settings.

If you are an advanced user, you may change the configuration using the efiutil utility.

Using the efiutil Utility

To configure the HBA, use the *efiutil* utility as follows:

1. Use the *fibreutils* RPM package to obtain *efiutil* (*efiutil.efi*) and the auxiliary driver, *efiaux.drv* as described in “[Installing the fibreutils RPM](#)” on page 24.
2. Power on the server to the EFI shell.
3. Start *efiutil* as follows (*efiaux.drv* is automatically loaded if it is needed):
 - a. Set the drive to the boot device (for example, `fs1 :`).
 - b. Change to the directory containing *efiutil*. For example, enter:

```
cd efi\qla2x00
```
 - c. Enter the file name:

```
efiutil.efi
```

Enter **help** at any time for information about commands.
 - d. Select the adapter that you want to configure by choosing **adapter**.
 - e. Choose **configure**.
4. Configure the HBA’s NVRAM by selecting the menu items for the parameters to be changed. Enter **help** for help at any time.

Note: Refer to [Appendix B](#), on page 41 to for information about these parameters.

5. Write the new configuration to NVRAM.
6. Exit the utility by entering **quit**.
7. Reboot the system.

Configuration Commands



This appendix describes the *efiutil* commands for advanced users who want to customize the configuration of the A6826A HBA and the connected devices.

Note: As described in [Using the efiutil Utility](#), page 40 use *efiutil* menu to configure the HBA.

NVRAM Parameter Commands

Use the following parameters to change NVRAM.

edit_adapter_settings

Used to display and modify the adapter settings. This parameter produces the following sequence:

Adapter Settings:

Enable Hard Loop Id

Hard Loop Id

Loop Reset delay

Enable Fibre Channel Tape Support

Frame Size:

512

1024

2048

Connection Option:

0 - Loop Only

1 - Point To Point Only

2 - Loop Preferred, Otherwise Point-to-Point

Data Rate:

0 - 1 Gb/s

1 - 2 Gb/s

2 - Auto

edit_advanced_settings

Used to display and modify the advanced adapter settings. This parameter produces the following sequence:

```
Advanced Adapter Settings:
Operation Mode:
0 - Interrupt for every I/O completion
5 - Interrupt when Interrupt Delay Timer expires
6 - Interrupt when Interrupt Delay Timer expires or no activity
Interrupt Delay Timer(100 ms)
Execution Throttle
Login Retry Count
Port Down Retry Count
Link Down Timeout(seconds)
LUNs per Target
Enable Extended Error Logging
Enable LIP Reset
Enable LIP Full Login
Enable Target Reset
```

edit_database

Used to display and modify entries in the WWN (world wide name) database.

edit_efi

Used to display and modify the efi parameters. This command produces the following sequence:

```
EFI parameters:
Enable Alternate Boot Device
Enable Boot Order List (disables Selective Login)
Enable Selective Logins
Enable Selective LUN Logins
Set Variable EFIFCScanLevel
```

Information Commands

help

This command displays a brief list of available commands.

info

Displays the following adapter information:

- efi device path (Use to determine which adapter configuration is being displayed.)
- port wwn (wwpn)
- serial number
- ssvd and ssdid from nvram

show_database

Displays the contents of the WWN database in table form.

show_translation

Displays the scsi target id translation table. This table is a list of scsi tid and fibre channel loop id mapping pairs. Each entry in the table consists of the following information for each device:

- scsi id (tid)
- fc loop id (lid)
- world wide port name (wwpn)
- world wide node name (wwnn)

All numbers are in hexadecimal. The tid values from 0x00 to 0x0A are persistent, and tid values above 0x0A are assigned sequentially as devices are discovered.

The lid values above 0x80 are fabric attached while those below 0x7f are arbitrated loop attached.

show_buffer

Displays the contents of the local NVRAM buffer in hexadecimal for the local buffer containing changes made prior to using the write command to commit them to the adapter NVRAM.

Operation Commands

abandon

Abandons the changes in the current configuration protocol local buffer and reloads its contents from the adapter NVRAM.

write

Writes the current configuration protocol local buffer to the adapter NVRAM. Use this command any time a command has been used to modify configuration data. When the NVRAM has been successfully written, the configuration protocol local buffer is reloaded from the adapter NVRAM.

quit

Quits the configuration and returns to the efi shell. You must use the write command to commit any changes to the adapter NVRAM prior to quitting.

Electrostatic Discharge



To prevent damaging the system, you must take precautions when setting up the system or when handling parts. A discharge of static electricity from a finger or other conductor may damage system adapters or other static-sensitive devices. This type of damage can reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always make sure you are properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm \pm 10 percent resistance in the ground cords. To provide proper grounding, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an HP authorized reseller install the part.

Note: For more information on static electricity, or for assistance with product installation, contact your HP authorized reseller.

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